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10/689,606	10/22/2003	Koichi Sakamoto	F03-161818M/SW	4797

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MCGINN INTELLECTUAL PROPERTY LAW GROUP, PLLC  
8321 OLD COURTHOUSE ROAD  
SUITE 200  
VIENNA, VA 22182-3817

EXAMINER

TRAN, NHAN T

ART UNIT PAPER NUMBER

2622

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/12/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	Application No. 10/689,606	Applicant(s) SAKAMOTO ET AL.	
	Examiner Nhan T. Tran	Art Unit 2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 October 2003.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Preliminary Amendments*

2. Preliminary amendments to the claims filed 10/22/2003 are accepted and considered in this office action. Currently, claims 1-7 are pending.

### *Information Disclosure Statement*

3. The information disclosure statement (IDS) submitted on 10/22/2003 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

### *Specification*

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

5. The disclosure is objected to because of the following informalities:

On page 9, fourth paragraph, "**the nose reduction process**" should be corrected to read as -- **the noise reduction process** --.

Appropriate correction is required.

### ***Drawings***

6. The drawings are objected to because **Fig. 1** shows reference number **114** being "NOISE IDENTIFYING SECTION" and reference number **110** being "CCD". However, the specification defines reference number **114** as "FACE IDENTIFYING SECTION 114" and reference number **110** as "an LCD 110" (see specification page 4). It appears that the "FACE IDENTIFYING SECTION 114" and "an LCD 110" defined in the specification are correct and in consistence with descriptions throughout the specification. Thus, Fig. 1 should be corrected to change "NOISE IDENTIFYING SECTION" of reference number **114** and "CCD" of reference number **110** to -- FACE IDENTIFYING SECTION -- and -- LCD --, respectively. A corrected drawing sheet in compliance with 37 CFR 1.121(d) is required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If

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the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

7. The drawings are also objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

On page 5, third paragraph, "[T]he A/D converter **33**" and "the analog signal processor **32**" are not shown in the drawings. Further on page 7, second paragraph, "the memory **37**" is neither shown in the drawings. Thus, corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

8. Claims 3-5 & 7 are objected to because of the following informalities:

Each of claims 3-5 & 7 recites a plurality of limitations "said **photography mode**"

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which should be corrected to read as -- said **photographing** mode -- to provide consistent claim terminology with independent claim 2. Appropriate correction is required.

Furthermore, claim 3 recites "**the** photography mode switch" which should be corrected as -- **a** photographing mode switch --. Appropriate correction is required

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claim 6 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Specifically, "a computer" is not disclosed by the specification. Although, in a third paragraph of page 10 of specification, the specification discloses "the invention is also applicable to an application program for performing image processing.", there is no specific disclosure of *a computer* to serve as means for generating face region information to identify the face region from said image data and means for performing noise reduction on the face region of the image data. Thus, claim 6 fails to comply with the enablement requirement.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claim 1 & 6 are rejected under 35 U.S.C. 102(e) as being anticipated by Luo et al. (US 7,092,573 B2).

Regarding claim 1, Luo (hereafter referred as "Luo") discloses an image processing method for performing image processing on image data (Fig. 1; col. 1, lines 5-9) comprising:

generating face region information (a person face 100 shown in Fig. 2, col. 10, lines 63-65) to identify the face region (face region 95 is identified as shown in Fig. 3) from said image data (see col. 11, lines 17-22 and col. 5, lines 37-55, wherein a face region is identified by the subject matter detector by creating a belief map);

and performing noise reduction on the face region of said image data based on said face region information (see Fig. 1, steps 40 & 60; col. 7, lines 36-38 and col. 11, lines 37-42, wherein the face region is enhanced by removing noise in addition to tone and color balance adjustments based on the face region information identified from the belief map).

Regarding claim 6, Luo discloses an image processing program (a software program for processing an image; Fig. 1 and col. 3, lines 40-66) for performing image processing on image data (input digital image in step 10 shown Figs. 1-6), said program causing a computer (col. 12, line 66 – col. 13, line 10) to serve as means for generating face region information to identify the face region (face region 95 shown in Fig. 3 is identified by face detection algorithm executed by the computer at steps 20, 22 & 30 in Fig. 1, col. 5, line 38-53 and col. 11, lines 17-22) from said image data and means for performing noise reduction on the face region of the image data (see col. 7, line 36-38, wherein noise on the identified face region is removed by the image enhancement algorithm executed by the computer at steps 40, 44, 60, 70 in Fig. 1).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 2 & 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ray et al. (US 6,940,545 B1) in view of Lobo et al. (US 5,835,616) and in further view of Luo et al. (US 7,092,573 B2).



Regarding claim 2, Ray et al. (hereafter referred as "Ray") discloses a digital camera (a digital camera 10 shown in Fig. 1; col. 2, lines 24-35 and col. 4, lines 15-22) comprising:

image processing means (CPU 30 executes algorithms 80, 82, 88, 90, etc. shown in Figs. 1-3) for performing image processing (e.g., face detection, exposure control, color balance, red-eye correction, etc.) on a shot image (Figs. 1-3; col. 2, lines 24-35, col. 5, lines 20-41 and col. 9, lines 1-5);

face region identification means (Fig. 1, face detection algorithm 90) for analyzing an image to generate face region information to identify the face region (see steps 120-130 and 220-230 in Figs. 3 & 4; col. 6, lines 60-64 and col. 8, lines 55-67);

photographing mode determination means (Fig. 1, user interface 50) for determining the photographing mode (framing mode or final image mode) of said shot image (col. 6, lines 48-55);

control means (Fig. 1, CPU 30) for operating said face region identifying means depending on said photographing mode (see Figs. 3 & 4; col. 6, lines 58-64 and col. 8, lines 55-67, wherein the face detection algorithm is executed to identify a face region in the shot image when the camera is set to either a framing mode or a final image mode).

Ray does not disclose the image processing means performing a contour correction on the shot image before identifying a face region.

In the same field of endeavor, Lobo et al. (hereafter referred as "Lobo") teaches an imaging processing apparatus that performs contour correction (edge enhancer at a first stage 110 in Fig. 2 that corrects contour of objects or so called edges of objects in.

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an image to help identifying a face region) in a first stage (110) prior to actual detecting stages (120-150 and 210-270) for detecting a face region (chin, face oval, eyes, nose, mouth) on an image so as to increase intensity variation at an edge in the image in order to better set forth curved shapes of a facial image for subsequent face detection stages (see Lobo; Abstract; Figs. 1-3 and col. 3, line 54 – col. 4, line 52. It should be noted that the facial features are actually detected in the subsequent stages after the first stage of edge enhancement).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a contour correction processing before identifying a face region in the camera of Ray so that the intensity variation near an edge of an image subject is increased to better set forth curved shapes of a facial image for subsequent face detection stages as suggested by Lobo.

Although Ray in view of Lobo teaches processing to correct contour on a shot image before face detection for detecting a face region as discussed above and then exposure control, red-eye correction, color balance, etc. are executed after contour correction and face detection depending on a photographing mode (a framing mode or a final image mode as disclosed by Ray in Figs. 2 & 3; col. 5, line 5-41; col. 6, lines 48-55 and col. 9, lines 1-5), Ray and Lobo do not explicitly teach noise reduction means for performing noise reduction on the face region of the image after contour correction based on said face region information, and said noise reduction means is operated by control means depending on said photographing mode.

However, as taught by Luo, an image processing apparatus performs image enhancement (Fig. 1, steps 40, 44, 60, 70) including noise reduction in addition to color balance adjustments on a human face region (face region 95 shown in Fig. 3) of an image *after* the face region was identified by face region identification algorithm so as to further enhance the image based on the detected region (see Luo, col. 7, lines 36-38; col. 11, lines 17-22, 37-42).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Ray, Lobo and Luo to arrive at the applicant's claimed invention by additionally providing noise reduction means to the digital camera for performing noise reduction on the face region of the image after face identifying process (also after contour correction as discussed above) based on said face region information, and said noise reduction means is operated by control means depending on said photographing mode (i.e., a framing mode or a final image mode). As doing this, the image quality would be further enhance by removing noise in addition to color adjustments on the detected face region of the image as suggested by Luo in col. 11, lines 37-42.

Regarding claim 3, Ray also discloses that said photographing mode determination means determines said photographing mode based on a mode selection signal from the photographing mode switch (user interface 50) on the camera main body (see Fig. 1; col. 4, lines 15-17 and col. 6, lines 48-55, in which a camera main

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body is inherent as the camera 10 where user interface 50 recited thereon to form an integrated system).

12. Claims 4, 5 & 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ray et al., Lobo et al. and Lou et al. as applied to claim 2 and in further view of Sannoh et al. (US 2003/0071908 A1).

Regarding claim 4, as analyzed in claim 2 above, the combination of Ray, Lobo and Lou teaches the control means operates said face region identifying means and said noise reduction means based on said photographing mode (framing mode or final image mode) determined by said photographing mode determination means.

Although Ray, Lobo and Lou are silent about said photographing mode determined as a portrait mode, such a portrait mode is taught by Sannoh et al. (hereafter referred as "Sannoh"). According to Sannoh, the control means (CPU 115a) of a digital camera (Fig. 2) executes face detecting processing to detect a face region in a captured image for further image processing when a mode switch (212 shown in Fig. 1C) is set to a portrait mode (Figs. 5A-5D) because, in the portrait mode, it is necessary to focus camera lens on the face, the face detection processing is necessary as disclosed in paragraph [0136].

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify the digital camera of the combination of Ray, Lobo and Luo in view of teaching of Sannoh to provide a portrait mode in which

the control means operates the face region identifying means and the noise reduction means when the portrait mode is selected so that the most important part (the face) of the captured image is considered and processed at a high priority as suggested by Sannoh above.

Regarding claim 5, as analyzed in claim 2 above, the combination of Ray, Lobo and Lou teaches the control means operates said face region identifying means and said noise reduction means based on said photographing mode (framing mode or final image mode) determined by said photographing mode determination means.

Although Ray discloses the framing mode and the final image mode in col. 6, lines 48-64 and col. 5, lines 41-62, a high-speed photographing mode is not disclosed. Lobo and Lou are also silent about the photographing mode determined as a high-speed photographing mode.

However, such a high-speed photographing mode is taught by Sannoh. According to Sannoh, the control means (CPU 115a) of a digital camera (Fig. 2) executes face detecting processing to detect a face region in a captured image for further image processing when a mode switch (212 shown in Fig. 1C) is set to a motion picture mode *or* a still picture mode (note that the motion picture mode captures *more images per second* at a higher speed compared to the still picture mode, the motion picture mode is thus considered as a high-speed photographing mode) so that the human object (i.e., a human face) is appropriately processed for recording even during a motion mode (see Sannoh, paragraph [0195]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify the digital camera of the combination of Ray, Lobo and Luo in view of teaching of Sannoh to provide a high-speed photographing mode, wherein the control means operates the face region identifying means and the noise reduction means when the high-speed photographing mode is selected so as to record more images per second at a high speed while maintaining the face region of captured image being always detected and processed to remove noise appropriately for enhancing image quality.

Regarding claim 7, all limitations of claim 7 are also met by the analysis of claim 5.

### ***Conclusion***

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Flinchbaugh (US 7,038,715 B1) discloses a digital camera that detects human facial features in a portrait mode to check for image quality to avoid characteristics such as eyes that are closed or a mouth that is open.

Lin (US 2003/0151674 A1) discloses a digital camera that runs face detection to detect human face and noise level on the face. If the noise level does not meet a threshold, a warning is given to the user.

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14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nhan T. Tran whose telephone number is (571) 272-7371. The examiner can normally be reached on Monday - Friday, 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'Nhan Tran', with a stylized, cursive script.

NHAN T. TRAN  
Patent Examiner